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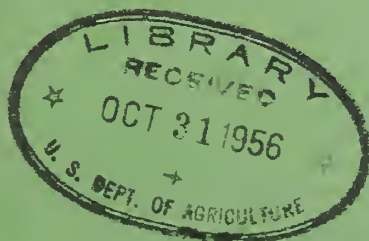
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A Report of Proceedings

Meeting of

USDA Soil and Water Conservation  
Advisory Committee



Washington, D. C.

October 27 — 28, 1955



## INTRODUCTION

Soil and water conservation activities constitute a substantial part of the U. S. Department of Agriculture's total program of service to agriculture. It is our desire that the Soil and Water Conservation Advisory Committee function on a continuing basis to advise me, my staff, and Department agencies dealing with soil and water conservation programs.

It is our objective to obtain from this Committee objective evaluation and constructive suggestions for program need and development, together with like consideration of the entire area of soil and water conservation as it is affected by the Department's work in the discharge of its responsibilities directly or indirectly concerned with this subject.

Ezra Taft Benson  
Secretary of Agriculture



UNITED STATES DEPARTMENT OF AGRICULTURE

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PROCEEDINGS AT MEETING OF

USDA SOIL AND WATER CONSERVATION ADVISORY COMMITTEE

October 27-28, 1955  
Washington, D. C.

Chairman - Ervin L. Peterson, Assistant Secretary of Agriculture for  
Federal States Relations

Secretary - Raymond W. Heinen, Soil Conservation Service

Members:

Leo L. Anderson, member, board of directors, Sexauer Seed Company,  
Fargo, North Dakota  
Earl T. Bower, officer, Wyoming Water Resource Board, Worland, Wyoming  
R. Edward Baur, director, National Association of Soil Conservation  
Districts, Van Meter, Iowa  
Dr. Firman E. Bear, retired chairman, Soils Department, Rutgers  
University, New Brunswick, New Jersey  
George D. Clyde, Commissioner of Interstate Streams, Utah Water and  
Power Board, Salt Lake City, Utah  
Bill Durham, farm editor, Fort Worth Star Telegram, Fort Worth, Texas  
Charles J. Elliott, member, board of directors, Illinois Agricultural  
Association, Streator, Illinois  
L. W. Garver, chairman, Farm Equipment Institute, Soil and Water  
Conservation Committee, Racine, Wisconsin  
L. Roy Hawes, Commissioner of Agriculture for the Commonwealth of  
Massachusetts, Sudbury, Massachusetts  
T. R. Hedges, former chairman, Washington Association of Soil  
Conservation Districts, Waterville, Washington  
Tom J. Hitch, president, Tennessee Farm Bureau Federation, Columbia,  
Tennessee  
A. D. Holmes, Jr., Area vice-president, National Association of Soil  
Conservation Districts, Gallion, Alabama  
Mrs. Katharine Jackson Lee, chairman, New Hampshire Natural Resources  
Council, Peterborough, New Hampshire  
L. L. Males, secretary-treasurer, Washita Valley Flood Control Council,  
Cheyenne, Oklahoma  
Raymond A. McConnell, editor, Nebraska State Journal, Lincoln, Nebraska  
Wade Newbegin, president, R. M. Wade & Company, Portland, Oregon  
William S. Rosecrans, chairman, California Board of Forestry,  
Los Angeles, California  
Carl D. Shoemaker, conservation consultant, National Wildlife Federation,  
Washington, D. C.





All members were present except Mr. Bower who had commitments for this two-day period prior to appointment to the Advisory Committee.

Thursday, October 27

FUNCTIONING OF THE ADVISORY COMMITTEE...Assistant Secretary Ervin L. Peterson

Mr. Peterson expressed the Department's deep appreciation of Committee members for taking their valuable time to serve on the Committee and advise the Department on soil and water conservation activities. He explained that soil and water conservation is one very important area of USDA work. The Department is giving increasing emphasis to soil and water conservation, especially water conservation.

He expressed the view that this diverse group can give the Department good advice on the protection, development, and improvement of our soil and water resources. He gave special emphasis to the extensive use of water in our national economy today, and indicated that water demands were increasing rapidly, underscoring the fact that water management conservation cannot be separated from soil conservation.

He explained why, at this time, it is impossible for the USDA to pay out of pocket expenses of members of this Advisory Committee.

Reference was made to the packet of materials given to each Committee member. Special attention was drawn to Secretary's Memorandum No. 1832 which establishes the procedures under which advisory committees must function. One requirement is that the chairman and secretary of advisory committees be employees of the Federal Government.

He designated Ray Heinen of the Soil Conservation Service as secretary to the Advisory Committee and asked that communications between meetings be channeled through the Advisory Committee secretary.

He instructed that a record of the meeting be sent to each member of the committee soon after the meeting.

Regarding term of office for each committee member, he explained that it was intended to establish terms of one, two, and three years by lot. Eventually all terms of office will be for three years on this permanent Advisory Committee. At the outset, however, it is necessary to have six one-year terms, six two-year terms, and six three-year terms, to get the rotating system working. He explained that the drawing process presented some problems because of diverse interests represented on the Committee and the geographic spread. He proposed that the group be divided into three geographic sections, the eastern U. S., central U. S., and western



U. S., and that there be two members selected for each term of office for each of the geographic areas. This procedure met with the approval of the group.

He emphasized that the Committee is to serve in an advisory capacity to the Department. He asked for frank discussion and sound advice and constructive criticism and suggestions. He emphasized that people in USDA have no monopoly on ideas or judgments but the Department does have final responsibility for actions finally taken.

He asked the heads of various agencies to give a brief review of the responsibilities assigned to each agency and the mechanism through which each agency functions.

#### REVIEW OF USDA SOIL AND WATER CONSERVATION ACTIVITIES

##### AGRICULTURAL RESEARCH SERVICE RESPONSIBILITIES FOR SOIL AND WATER CONSERVATION RESEARCH

G. W. Irving, Jr., Deputy Administrator, ARS

We in the Agricultural Research Service believe there is no more important work we can do than to help conserve and improve the soil and water resources of our country. Both security and prosperity depend upon these basic resources.

We are carefully evaluating our research to see where we fall short of meeting the needs uncovered by the conservation action programs, and we sincerely want your guidance in developing a fully adequate research program. We must neglect no opportunity to bring to bear upon our soil and water problems the best help that the science of today and tomorrow can offer.

It so happens that we are in a better position than ever before to evaluate conservation research. In cooperation with the Soil Conservation Service, we have been developing a system of two-way communication that promises to enable us to work together practically as one agency.

The system works like this: SCS asks its people in each State to report the problems on which they need facts that are not now available. In most, if not all States, the report of research needs is prepared by a committee which includes the State College and all Federal and State agencies concerned with conservation. SCS combines the information from the States and reports to the Administrator, ARS, what the problems are that are not being attacked by Federal or State research. In our office, then, we see to it that each reported need receives the attention of the appropriate branch of ARS or is referred to other agencies such as Forest Service or Interior's Fish and Wildlife Service.

Right now we are in the process of preparing a response to the research needs reports, and as a result of our analysis we will be able to show not only what we are doing to meet the reported needs but also, and perhaps more important, what we have not been able to start.





In this process we will list all of our recent scientific papers and publications bearing upon the listed needs.

ARS also systematically reports to conservation program workers the results of its studies as soon as there are results. Administrative annual reports that contain research data and other progress reports are now made available to conservation program workers. In addition, progress reports geared primarily to the interests of program workers are now being issued quarterly and being made available in quantity to SCS and Extension by the Soil and Water Conservation Research Branch. That Branch also issues abstracts of scientific and technical literature for the benefit of both research and action program workers. And various Sections of ARS report regularly through the columns of the official SCS periodical, the Soil Conservation Magazine.

In addition to having a system of communication, we have a spirit of cooperation. We and SCS have several joint employees who have been helping us develop our systematic communication. But we know that cooperation is the responsibility of all of us in both agencies. We are glad to say there are many day-to-day contacts between technical personnel of ARS and SCS, in offices and also in the fields and watersheds where difficult problems exist. In the West, some of our irrigation and drainage people are regularly scheduled to spend a considerable portion of their time in the field giving assistance on specific problems. Irrigation and drainage experts of ARS and SCS are holding joint work conferences.

When the research work of SCS was combined with that of ARS--partly in 1952 and partly in 1953--we in ARS accepted responsibility for providing direct service to the action program. We are consciously, deliberately, and very gladly living up to that responsibility to the best of our ability. But we hope to be able to do a much better job. And we want your help.

#### EXTENSION'S RESPONSIBILITY IN CONNECTION WITH SOIL AND WATER CONSERVATION

C. M. Ferguson, Administrator, FES

The Extension Service is a cooperative or partnership organization rather than a straight line agency. This partnership is direct as between the Department of Agriculture and the individual State colleges and, in turn, between the State colleges and the individual counties in the respective States. The relationship is completed by extension workers holding cooperative appointments with the Department of Agriculture.

In this set-up the individual States have the responsibility for planning educational programs to be carried on within the respective States. This, however, is done with consultation from the Federal Extension Service but not through orders from this Service. The same relationship pattern holds true between the county extension staffs within a respective State and the State land-grant college.



Within each county there is a group of volunteer local people counseling and advising with the extension staff, helping them to determine what the major extension program emphasis will be in the county. Thus the local extension educational program reflects the most pressing needs as farm people in the county see them. The extension staff provides facts of State-wide and National interest along with pertinent data on county situations.

Extension's primary function, therefore, is one of rendering educational assistance to farm families with problems as they see them. At the same time, of course, the professional extension worker has a responsibility to help farm people think their problems through and to use his influence in getting them to recognize problems which, from his professional background, he may be somewhat better able to evaluate on an area-wide basis.

Providing educational assistance with respect to problems of conservation is an important part of Extension's educational responsibility and of its program efforts. Problems of soil and water conservation have a definite bearing on the ability of a farm family to maintain a satisfactory level of living and is one of several major areas of problems which every family must consider if it is to attain the fullest in terms of satisfaction. Extension's job involves working with individual farm families, helping them to identify both their problems and their opportunities and to find the most feasible ways to solve the former and capitalize upon the latter. With specific reference to conservation problems, Extension's function may be described as follows:

1. To develop an awareness on the part of farmers and ranchers of the importance of conservation to their immediate and long-time welfare.
2. To acquaint farmers and ranchers with practical methods of conservation and utilizing soil and water resources consistent with sound long-time farm and range management.
3. To demonstrate the effective application of such measures and the values to be derived from adoption of appropriate conservation practices in relation to other elements of their long time plans, and
4. To encourage farmers and ranchers to utilize appropriate soil and water management practices in their individual farm and ranch operations.

In performing these functions the Extension Service, of course, has a collateral responsibility of insuring that farmers and ranchers have a knowledge of all resources which may be available to them and which can be appropriately utilized in overcoming particular problems of which conservation problems are a good example. In turn, if a farm family is faced with a credit problem in undertaking to establish some major conservation





measure such as terracing, then Extension has a responsibility to counsel with such farm families as to the various sources of credit that might be available, their characteristics, advantages and disadvantages, and the like. However, it is not Extension's function to undertake to admonish such a family that they should or should not undertake a specific measure or should utilize a specific source of credit. That is the responsibility of the farm family itself, the exercise of which responsibility is prerequisite to the establishment and maintenance of a sound long-time farm or ranch program.

## RESPONSIBILITIES AND FUNCTIONS OF THE SOIL CONSERVATION SERVICE

D. A. Williams, Administrator, SCS

The Soil Conservation Service is the Department of Agriculture's technical arm of action for soil and water conservation. We are directed by Public Law 46, 74th Congress, to develop and carry out a permanent national soil and water conservation program.

It is the special function of the SCS to bring together in one staff the conservationists needed for solving land and water problems. The nationwide staff is comprised of conservation technicians, soil scientists, agricultural engineers and irrigation, hydraulic, and cartographic engineers, and specialists in woodland, biology, range management, agronomy, and plant materials.

The Service's soil conservationists are trained to coordinate and apply to a particular farm's need and conditions the knowledge necessary for conservation of soil and water resources. They assist farmers and ranchers, directly on the ground, planning and applying land-use adjustments and in using the combinations of conservation practices needed to control erosion, preserve and improve the productivity of soils, conserve water resources, and use the soil and water resources for efficient and profitable farming. Last year the Soil Conservation Service provided on-site assistance to about one million two hundred thousand individual farmers and ranchers.

These conservation operations are conducted through memorandum of understanding with the Nation's two thousand seven hundred soil conservation districts through which our technicians give technical help to farmers and ranchers on their soil and water conservation problems. These districts include more than 90% of the Nation's agricultural land.

Soil scientists make detailed soil surveys of individual farms. Planning technicians assist farmers in drawing up a conservation plan based on the needs and capability of the land and the decisions of individual farmers regarding the type of cropping and farming the individual farmer prefers. Technicians assist farmers in the application of complex conservation practices called for in their conservation plans such as contouring, strip cropping, terracing, drainage, irrigation layout, farm pond construction, etc.



Other Soil Conservation Service duties have to do with such activities as watershed development and the technical phases of the Agricultural Conservation Program. The Soil Conservation Service is assigned responsibility for administering the Department's upstream flood prevention and watershed protection activities as an integral part of the total soil and water conservation job. We are responsible for assisting in the ACP program by helping in the development of the annual program, by providing needed technical assistance to farmers who participate in the cost sharing provisions of that program, and by providing technically adequate designs and specifications for the jobs undertaken.

The Soil Conservation Service is also responsible for administering the Federal part of the National Cooperative Soil Survey, for supervising the agricultural phase of water utilization activities in Western States, and for making and coordinating snow surveys for water forecasting in the Western States.

#### FOREST SERVICE ACTIVITIES IN RELATION TO SOIL AND WATER CONSERVATION

Richard E. McArdle, Chief, FS

The Forest Service has been active in soil and water conservation for a long time. More than 50 years ago Congress recognized the important relationship between forests and water when the basic Act of June 4, 1897, provided for establishment of national forests (from the public domain) "for the purpose of securing favorable conditions of water flow and to furnish a continuous supply of timber..." Subsequent legislation, including the Weeks Act of 1911, the Clarke-McNary Act of 1924, and the McSweeney-McNary Act of 1928, continued to recognize this important relationship. One of the purposes of the Weeks Act was to enable the Secretary of Agriculture to cooperate with the States "in the protection from fire of the forest watersheds of navigable streams." Another purpose was acquisition of land to protect the headwaters of navigable streams. One of the basic purposes of the Clarke-McNary Act is to protect the watersheds of navigable streams by extending financial and other cooperation to the States. The McSweeney-McNary Forest Research Act of 1928 authorizes determination and demonstration of the best methods of maintaining favorable conditions of waterflow and prevention of soil erosion.

The Forest Service, under these four basic laws and many supplementary Acts, carries on three primary activities: (1) Protection, development, and use of 161 million acres of federally owned land; (2) cooperation with the States and private forest landowners to obtain fire control, reforestation, and better forest practices on another 400-plus million acres of State and privately-owned forest lands; and (3) forest research and range management research for all forest lands and related range lands to bring about better protection from fire, insects, disease; to increase productivity and to facilitate full utilization of forest, water, and range resources, and more profitable production of timber and forage.





## AGRICULTURAL CONSERVATION PROGRAM

F. G. Ritchie, Acting Administrator, ACPS

The ACPService is an agency of about 55 people, all stationed in Washington. We have no field offices.

We administer the ACP at the National level. While the program was authorized in 1936 for the dual purpose of conservation and income restoration, Congress has limited it to conservation since 1943. Currently it shares the cost of the initial application of those amounts of certain conservation practices which it is believed farmers and ranchers would not perform with only their own resources.

The program is administered at the State and county levels through the Agricultural Stabilization and Conservation Committee system. The Soil Conservation Service and the Federal Forest Service assist these committees in technical matters and have specific responsibilities for determining the need and practicability of certain of the more complex practices, for supervising their installation and for determining that they are properly carried out before the committee pays the Federal cost-share on them. The Commodity Stabilization Service supervises the field work of the committee system on ACP.

The specific responsibilities of the ACPService are:

1. To develop and issue all program and operating policies which apply nationally. SCS and Forest Service have joint responsibility with ACPS for National program formulation. Operating policies are developed in consultation with CSS, SCS, Forest Service, and the Federal Extension Service wherever they are affected by those policies at the State and county levels.
2. The ACPS reviews and approves all State programs for the Secretary.
3. ACPS handles the program fund; that is, we justify it to Congress, distribute it to the States, and report on its use. (State and county committee expenses are the responsibility of the Commodity Stabilization Service.)
4. We analyze the effectiveness of each State program and work directly with the agencies at the State level in seeking to improve their program.

A National program is developed annually. It is based on recommendations solicited from all interested agricultural organizations and agencies at the county and State levels and on the directives set forth by the Congress in the Appropriation Act authorizing funds for that particular program.



The ASC Committees, of which Extension Service is a member, and the Soil Conservation Service, and the Forest Service, at the State and county levels, jointly develop annually a program for their State or county working with all other agencies and organizations concerned with conservation at that level. These programs must be within the bounds of the national program. ACP is truly a joint program of many agencies and interests.

FARMERS HOME ADMINISTRATION ACTIVITIES  
IN THE FIELD OF SOIL AND WATER CONSERVATION

Homer D. Cogdell, Assistant Administrator, FHA

The Farmers Home Administration has broad authorities to help farmers and ranchers finance soil and water conservation practices on their farms and ranches. Under its several programs, loans are made to pay the cash costs for materials, equipment, and services related to the application or establishment of measures for soil conservation; water development, conservation, and use; and drainage. Included are such items as the construction and repair of terraces, ditches, ponds, tanks, land leveling, the establishment or improvement of permanent pastures, tree planting, well drilling for domestic and irrigation purposes, the purchase of pumps and irrigation equipment and other soil and water conservation installations and practices that are in accord with recommendations made by the Extension Service and the Soil Conservation Service.

Although loans made under the Bankhead-Jones Farm Tenant Act for farm purchase and development or production purposes may include funds for soil and water conservation, our principal activity in the field of financing soil and water conservation practices is under the authority of the Water Facilities Act of 1937. Credit for farm irrigation systems and farmstead water supplies has been available under this Act in the 17 Western States since 1937. Public Law 597, which was passed by the 83d Congress, extended these loans to the entire United States, authorized loans for soil and water conservation purposes, and also included a provision for Government insurance of such loans made by private lenders.

To be eligible for a loan, a farmer must have reasonable prospects of conducting successful farming operations and be unable to obtain the credit he needs from other sources. Loans may be made to non-profit associations such as incorporated water associations, mutual water and drainage companies, irrigation and drainage districts, and soil conservation districts when they are unable to obtain adequate credit elsewhere.

Applications for loans may be made at any of the 1,512 county offices of the Farmers Home Administration. The applicant's eligibility is determined by a 3-man County Committee, at least 2 of whom are farmers. Most loans are approved at the county level; large loans, however, are approved by the State or National Office. The Farmers Home Administration has 41 State Directors who report directly to the National Office.





Loans are scheduled for repayment within the shortest period consistent with the borrower's ability to repay. Loans to individuals may not exceed 20 years. Each loan is secured by the best lien obtainable on chattels or real estate to the extent necessary to adequately protect the Government's investment. Borrowers are required to refinance their loans when they are able to obtain a loan at reasonable rates and terms from other sources.

Individuals can borrow amounts up to \$25,000; Association loans have a ceiling of \$250,000. Loans made with Government funds bear  $4\frac{1}{2}$  percent interest. Insured loans yield the lender  $3\frac{1}{2}$  percent and the borrower pays an annual 1 percent loan insurance charge.

Applicants must obtain whatever engineering assistance they need from the Soil Conservation Service, Extension Service, or other agencies, individuals, or firms. Technical assistance from the Farmers Home Administration is limited to a review of the engineering and economic soundness of the improvements to be financed. When necessary, farmers who use loan funds to finance major land use adjustments and extensive reorganization of their farm business will receive assistance from the County Supervisor of the Farmers Home Administration in the development and execution of sound farm and home plans.

#### COMMITTEE MEMBERS' STATEMENTS ON SOIL AND WATER CONSERVATION PROBLEMS

Each member of the Advisory Committee was asked to make a statement not to exceed five minutes on soil and water conservation problems in respective areas. The following is the Advisory Committee's secretary's summary of those statements.

##### Mr. Shoemaker

The wildlife interests do not feel that everything should be predicated on wildlife, but they do believe that all agricultural programs should give due consideration to wildlife needs.

Drainage, especially of pot-holes in North and South Dakota and Minnesota, is often unwise because pot-holes are important to waterfowl and upland game. Early Soil Conservation Service work in this respect was probably ill advised. USDA now has a fine working arrangement with Fish and Wildlife Service.

Wetlands are often more valuable for wildlife use than for agricultural use. There is need to take care of our resources so that all individuals can enjoy a little of the outdoors. There is a big interest in conservation from the 18 million fishermen and 10 million hunters in the United States. Sportsmen are trying to carry their own way in paying for the help they get. They do this through the purchase of duck stamps and payment of excise taxes on arms, ammunition, and fishing equipment.



Whatever is done in water development will affect fishing, and benefits that will accrue to 30 million sportsmen should be recognized. The recreational aspects of conservation are a great asset in our modern way of living.

Mr. Rosecrans

Our land mass is large but the amount of good soil is extremely limited. Soil is thin and fragile. The integrity of the few inches of topsoil is the key to whether we have enough crops for food, fiber and shelter in the future. The impact of population growth on soil and water resources is terrific.

In California, water problems are paramount. Conditions are extremely varied. Precipitation varies from 2 inches to 100 inches annually. Some soils are stable and some are highly erosive. State appropriations for conservation have increased twelve fold during the last decade, but it still isn't enough.

One real big problem is the heavy migration of people to the State. New people coming in are not aware of the soil and water problems in the State. To inform these people of these problems and what is being done about them and what can be done about them is an enormous challenge.

Mr. Newbegin

Oregon can be divided into two sections on the basis of water supplies. The eastern part of the State is extremely dry. The western part is extremely wet. Ten years ago, it was thought to be impossible, but the western part is now faced with water problems. In some western counties water is being used to the limit.

One recent development has been the installation of 150,000 acres of portable irrigation systems privately financed. From experience in Oregon it is apparent that people in the humid east should become more concerned about water. There is urgent need for a coordinated program of water use in the United States.

Mr. McConnell

Concurred in Mr. Newbegin's conclusions. The Nation needs a sound long-range national water policy.

Some important steps have been taken. We are heading in the right direction. We need to build toward a policy premised on the wisest possible use of water beginning at the top of the Great Divide and following on down through the country.



Certain principles can be laid down which can be applied to the Great Plains, to New England, to the West, etc., to develop water supplies for industrial uses, domestic uses, and recreational purposes. He expressed his personal interests in examining legislative, budgetary and administrative aspects of this problem.

There is need to build on the foundations that have been laid, such as Public Law 566. A very pressing immediate problem is to examine the operation of the Watershed Protection and Flood Prevention Act to make certain that we are getting what the country expects and what the Congress intended. He also urged the completion of work on the 11 authorized watersheds as soon as possible.

Mr. Males

In Oklahoma there are both dust bowl and flood problems. Both problems are involved in the Washita Watershed. The soils there both blow and wash. There are flood problems even in the low rainfall area.

We have found from experience what can be done. We have a good soil and water conservation program and good agency carrying it out. He knows from personal experience that it will work.

In that area which was the dust bowl of the 30's there have been four years of dry weather and still no recurring dust bowl. Heavy rains have occurred with no flooding on Sandstone Creek which has received watershed protection treatment. The past 20 years have been more than worth living if for no other reason than to see the evolution of our soil and water conservation program.

We have come a long way, but we are making haste too slowly. He urged completion of work on the 11 authorized watersheds so they will serve as a living example that this flood prevention program will work on projects of river size. More money is needed for work on these watersheds. At present we don't get enough to wad a shotgun.

We must think in terms of generations instead of years with the soil and water conservation programs. It is and will be successful.

Mrs. Lee

In New England the primary problem is water. There are great opportunities for retaining water in the upper watersheds, much of which is woodland and forest land.

Supplemental irrigation is one of the urgent water problems. There are real opportunities for conserving water by building many small dams in the upper watershed to hold water and help in prevention of floods. Water can be retained in the soil where it falls through accepted conservation methods.





We need to make soil and water conservation more visible to the average man and to prove its value to farmers. Farmer must be able to see that it pays. Good land management is a real aid in flood prevention and water conservation. Conservation measures such as contouring and strip cropping are helpful in preventing floods. Public must be informed on this and land operators must cooperate.

Mr. Holmes

His main interests are in Soil Conservation Districts because he has seen what districts have done for agriculture in the black belt of Alabama. Years ago these soils were most productive of cotton until erosion set in. Now many eroded soils have been converted to fine grassland for livestock through Soil Conservation Districts.

Today we have 3 milk plants in the district with a payroll of over \$6 million where before there was one small milk plant that was struggling to stay in business. There are three livestock markets, each worth over a million dollars.

He expressed the view that districts are an ideal mechanism through which all USDA programs could operate. All agencies, Federal and State, should be encouraged to work more through districts.

We need new plant materials and nursery stock. The present grass and legume nursery arrangements are inadequate. He urged more use of ACP cost-sharing on permanent-type practices. The small watershed work is a step in the right direction but changes are needed in Public Law 566 so that more federal money can be used for larger structures.

Despite heavy annual rainfall, there are droughts in this area. Water conservation and supplemental irrigation are big problems.

Mr. Hitch

Problems in Tennessee are much the same as those described in other areas. Although there is plenty of rain it is not distributed over the season as we need it.

The flood control job on the main basins has been done well by TVA. There are siltation problems on major reservoirs. Much of the siltation comes from small holdings which must be farmed intensively to make a living, or which is left bare while the people are working in town to make a living. Much of the responsibility rests with the men who own and operate land. There is a big educational job to do.

Cooperation among agencies doing conservation work is very good. One need is for more adequate soil survey of the cooperative type between the Soil Conservation Service and the State College.





Mr. Hedges

He concurred in all that had been said. Problems in Washington are generally not much different. New lands being brought into production through irrigation presents a specific problem. About a million acres is going under irrigation, and is being settled by a diversity of people, who are often lacking in conservation information.

One problem is the losing of old lands through alkali and poor drainage of irrigation water. Another is that with the price-cost squeeze it is harder to get conservation farming applied.

We don't need a lot of new laws for soil and water conservation. We need to better implement the program we already have.

Mr. Anderson

Much interest is developing in water conservation in North Dakota. Farmers are looking forward to bringing two million acres under irrigation in the next 15 or 20 years. He directed the rest of his comments to national problems.

It is most important to work together in solving the total soil and water conservation problem. He doubted whether we need additional legislation. We have plenty of tools to work with. The major need is to step up our present action programs and to establish priorities to get on faster with the work.

Price supports, parity, etc., should be separated from conservation action programs. Conservation cost-sharing should be used completely to help get conservation applied rather than to be considered as an income supplement.

Conservation farmers have been penalized by the present method of determining acreage allotments. Ways should be explored to give such farmers credit for proper land use.

Progress of the last 20 years has been good, but we are thinking too small on soil and water conservation needs, especially on water utilization.

Suggested that it would be desirable to be able to submit ideas in writing.

NOTE: The Chairman invited all members of the Advisory Committee to send ideas in writing. He encouraged free communications.

Mr. Baur

There is much satisfaction in the progress being made in soil and water conservation. As we look to the future, however, we lose that satisfaction. Population growth will put terrific demands on the land. The emphasis is shifting more and more to permanent type of practices. This trend is in the right direction, but we are not going fast enough.



There is need for better understanding among local people of all the assistance that is available to them. The State of Iowa appropriates \$400,000 annually for soil conservation districts. There is need to get local people to better understand their responsibilities and opportunities. We are not making the fullest use of existing facilities. More responsibilities should go to local people through soil conservation districts.

A lot of the future will depend on the leadership that districts can give. All farmers are entitled to the benefits that districts can give to them.

Dr. Bear

He looked at soil and water conservation problems in view of our population growth. Population increased 2.8 million last year. Increasing population needs not only to be fed and clothed. They also need room to live and move about in, which places an added strain on our land resources.

Our "city" extends from Boston to Norfolk. Eighty-five percent of our population live in cities. Forty percent of them live in cities of 100,000 or more. We are encroaching upon good agricultural lands with non-agricultural uses. The New Jersey Turnpike took 4,250 acres of our best land. The Ohio Turnpike took 8,000 acres. Our educational campaigns should be aimed at the city people.

He feels very keenly about the Soil Conservation Service and soil conservation districts. There is nothing like these two on earth. We must maintain an independent Soil Conservation Service. It was right to transfer the soil survey to Soil Conservation Service. That is where it belongs. It was wrong to transfer Soil Conservation Service research to Agricultural Research Service. It was wrong to abandon the Soil Conservation Service nurseries. All these things should be in one package in SCS. We should use ACP for permanent-type work. It is too transient in its activities.

We have come a long way in our start on solving soil and water conservation problems. There is a tremendous challenge ahead. He expressed hope that this advisory committee work can speed up progress.

Mr. Clyde

Water is the one essential to life for which there is no substitute. Three-fourths of the earth is water, but only one-fourth of the remaining one-fourth of the earth has enough water. Water has two uses, consumptive and non-consumptive. There is no substitute for consumptive use, but there are substitutes for some of the non-consumptive uses. Many areas are faced with total consumptive use of available water, particularly in the west but also on the upper reaches of watersheds in the east.



The impact of water shortages in the east will be greater than in the west because of the greater population and the fact that the source is rain, not snow-pack, as in the west. In snow-fed areas complete control of water through storage is possible, but this is not possible in rain-fed areas.

There are conflicts of interest in use of water. Domestic and municipal users must have priority because such use affects the lives of people.

Research on water should be in the Soil Conservation Service as it once was, because research findings could be reduced to practice at once in soil conservation districts. Soil Conservation Service had a natural laboratory to test the results of research. Miniature experimental farms and plots do not fit natural conditions.

The doctrine of riparian rights is totally inadequate. The doctrine of appropriation is essential.

Mr. Durham

One of the big opportunities for moving ahead with the soil and water conservation work is to make more use of local leadership. Soil Conservation Districts are an ideal vehicle for doing this. All agencies should recognize districts as the local conservation authority and work with them.

Conservation accomplishments were slowed down during the reorganization of the Soil Conservation Service. It was demoralizing. Some good men left their jobs. Recovery has not yet been full.

The problem in the Great Plains is to develop a system of farming that protects the land and permits farmers to make a living. Changes are needed in the cost-sharing aspects of Public Law 566. We should push completion of the 11 approved watersheds. There is need for more coordination of the work of the army engineers with that of the Soil Conservation Service. There is need for more state participation in the soil and water conservation movement.

Mr. Elliott

Only recently have we come to realize the need for holding water back on the land where it falls. Water tables are going down. In northern Illinois the water table has declined 110 feet in the last ten years. The use of water for such things as air conditioning and steel manufacturing is drawing heavily on our water resources.

Remedial practices through vegetation is possible. When soil loses its humus it loses water holding capacity. We are now losing 65 percent of the water that falls through run-off. Holding water on the land will help to build up the water table. We must maintain reservoirs and ponds and recover water used for things such as air conditioning.





One problem with the small watershed program is that it has no provision for maintenance except by local people. He encouraged State governments to contribute to works of maintenance.

There is need for more education about soil conservation to get the people to understand it. Conservation weeks are good and make a contribution. There should be conservation demonstrations in parks, etc. The historical base for acreage allotments is not good because it penalizes conservation farmers.

He urged storing soil fertility in the soil instead of grain bins. If we don't take care of our soil we can get like China.

Mr. Garver

He expressed interest in the commercial aspects of the soil conservation movement. The Farm Equipment Institute has taken an active interest in helping local communities to see how the application of conservation measures on the land is good for business in the community. The industry has focused its emphasis on encouraging local farm equipment dealers to cooperate with soil conservation districts to enhance farm income and protect the soil.

There is a place for educational work in the commercial world in addition to recognized sources such as government and educational agencies. Business people can encourage and help farmers to carry out all phases of their conservation plans, which their soil conservation district helped them develop.

Some 3,000 farmers interviewed by farm equipment retailers reported an average income increase of 30 percent through conservation farming.

He suggested some type of packaging conservation for an attractive look, like the farm equipment industry does with a new model tractor, to give more promotional opportunities.

Mr. Hawes

He added to the New England point of view of Mrs. Lee. He complimented the Federal conservation agencies on the work they are doing in New England. Most programs by-pass New England because their problems are different. The soil and water conservation activities, however, fit the needs admirably. The Agricultural Conservation Program method of payments works to the advantage of farmers. Because of the small size of most operations, the FHA credit may leave something to be desired.

There might be value in establishing a specific agency to look after all water resource matters.





## SOLVING THE CONSERVATION PROBLEMS IN THE GREAT PLAINS

Background by C. M. Ferguson, Director, Federal Cooperative Extension Service and D. A. Williams, Administrator, Soil Conservation Service

The Chairman explained that last spring Secretary Benson recognized the need for coordinating programs of the Department with state and local programs to stimulate local people to bring all possible assistance into focus on the wind erosion problem of the Great Plains to better help local people solve their problems. He recognized that the land damaged from wind erosion during the recent drought was not as severe as in the drought of the thirties, largely because of the conservation program in effect in the area since then.

The question confronting the Department was how to bring agricultural stabilization activities into better compatibility with our conservation objective. The Department's purpose is to bring the two concepts into harmony with each other. He told how Secretary Benson had toured the area in April and called a meeting of governors from the ten Great Plains States in early June.

Mr. Ferguson reviewed the Denver report on the Great Plains Agricultural Conference and reviewed the following background.

Droughts have been a feature of the Great Plains for centuries. The present drought is the fourth that has occurred since the area was settled by farmers in the 1880's. The droughts of 1890-95 and 1931-38 were so severe and so persistent as to cause widespread depopulation. The latter drought brought major dust storms and earned the region the name "Dust Bowl."

Short droughts, of one year or less duration, are common throughout the Plains. They are often economically disastrous to numerous individuals. But they seldom cause widespread damage to the land. Long droughts, of two years or more duration, don't come often, but when they do come, they are likely to ruin many farmers or ranchers and result in severe damage to much of the land.

Pioneers in the area have stated that dust storms occurred even before any cultivation. So, it may not be feasible to prevent all dust from blowing, but it should be possible to prevent the widespread damage from wind erosion. Also, the Great Plains is subject to intense rainstorms. Damage from water erosion during these storms may be severe locally.

This vast productive agricultural empire holds great potential for producing a dependable prosperity for its citizens. The farm products from the region helped win two world wars. It can be a great reservoir of productive strength in time of future national emergencies if wisely managed to conserve and increase its productive capacity.



These great potentials can be fully realized only by putting into effect the practices and procedures that will more completely control the effects of the weather hazards. Drought, floods, and other disasters, cannot be prevented -- but the damaging effects can be greatly reduced. It must be done by people. Hence, we may say that the problem of alleviating the damages, is a problem of, by, and for the people -- mainly the people living on these Plains.

One of the institutions devised in the Plains, is the Great Plains Agricultural Council. It grew out of a widespread recognition in the early 30's of the need to review the Plains as a distinct agricultural region with characteristics and problems all its own. Drought was the immediate problem and has continued to demand attention.

The membership of the Council consists of representatives from the ten Land Grant Colleges in the Plains and representatives from the U. S. Department of Agriculture. Its purpose is to facilitate exchange of ideas among agricultural workers and leaders, to encourage study of Plains problems, and to aid in the adaptation of agricultural programs to better meet Plains conditions. It works through voluntary study committees, several of which have worked continuously over many years.

He then highlighted points from the "Guides to a Successful Long-Range Program in the Great Plains"(pages 1-5 of the report). He emphasized items 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 18, 19, and 22.

Mr. Williams reviewed the following actions to adjust programs toward solving conservation problems in the Great Plains.

1. The soil survey activities of the Soil Conservation Service are being stepped-up in the Great Plains. The soil survey provides an inventory of the soils and is basic to the development of the land capability classification to determine its proper use and management.

By expanding our staff of soil surveyors in the Great Plains, we have so far increased our soil survey staff by about 50 persons in the area.

2. The Soil Conservation Service is providing additional technical assistance to soil conservation districts within our available resources to step-up the planning and application of conservation measures on the land. So far, 3 to 4 additional technical personnel have been added in each State.

The Soil Conservation Service is also furnishing the needed technical assistance in the conservation activities of other agencies such as FHA credit and ACP cost-sharing.





3. The 1956 Agricultural Conservation Program has been made more flexible. Rates of cost-sharing for certain practices have been increased to over half of the cost. There is also a provision which permits the payment of cost shares on completed components of practices. This provision is of special value in the Great Plains in seeding erosive cropland to permanent vegetative cover.

The cost-sharing offered for terraces, contouring, subsoiling, strip cropping and water holding and management structures is particularly important in the Great Plains.

4. In cooperation with the State Colleges of Agriculture, the USDA is intensifying extension education work in the Great Plains to encourage farmers and ranchers to adopt and use those practices which will contribute most to the long-time stability of agriculture in this area.

Efforts are also being made to inform business groups and others in the area of the nature of the major problems involved, their most practical solution, and the significance of proper solutions to the welfare of the area and the Nation, in order that such groups may be better equipped to contribute to a sound solution of the problems involved.

5. A Great Plains Land Use Films Project on wind erosion control has been approved on a cooperative basis between the University of Nebraska and the USDA.

A series of seven teaching films will be produced. These will be suitable for television and accompanied by Bulletins and teaching guides.

6. A new credit program for the Great Plains area has been initiated. The program combines established real estate and production loan programs of the Farmers Home Administration with a greatly expanded emergency loan program.

In areas designated by the Secretary, loans are available for reseeding and the establishment of grasslands and other approved conservation and land use practices including soil and water erosion control measures, development and improvement of domestic and irrigation water supplies, repair and improvement of existing farm buildings, and the purchase of additional land needed to enlarge a farm to a family-type size.

7. State Agricultural Stabilization and Conservation Committees have reduced to 75 percent the requirement for an acreage allotment to be planted to maintain the "base acreage."

3. A joint meeting between representatives of the U. S. Weather Bureau and the USDA has been held to explore the needs for weather research. Further exploration as to Agriculture's need for weather record analysis and the types of analyses required is being made.





9. Exploratory steps have been taken with credit agencies in the development of landing policies which will further sound land use and meet with the needs in the Great Plains area.
10. USDA agencies are continuing to explore the possibilities of additional actions and are studying what can be done to bring organizations and agencies in the States into a more active part.

The Great Plains Agricultural Council has set up a Committee on Research Application and Need. Their responsibility will be to give leadership to research efforts in developing priorities and coordinating and integrating research efforts on a Great Plains basis.

11. Many local soil conservation districts are re-examining their programs and work plans in an effort to focus them more sharply on the long-time stability of agriculture in the individual districts.

The following questions were put before the Committee as a basis for discussion.

1. What local mechanism can be most effective through which land owners and operators can bring about proper land use and sound management which will contribute most to the long-time stability of agriculture in the area?
2. To what extent should Government programs be conditioned upon proper land use and management vs. the use of incentives to encourage proper land use and conservation farming?
3. To what extent can the land classification, after it has been accepted and approved by local people, be utilized for:
  - a. credit?
  - b. ACP cost-sharing?
  - c. crop insurance?
  - d. crop acreage allotments and price supports?
4. In contractual cost-sharing arrangements between land owners and the Government for making major adjustments in land use (sometimes involving changes in type of farming), about what percent of the total cost should be borne by the Government?
5. Should there be any modification in ACP to make it bear more effectively on Great Plains problems?
6. What research in soils, plant, and moisture control needs to be expanded or initiated?



7. Should State governments be encouraged to enact ordinances or regulations to prevent using land improperly once adjustments have been made? (Such as land-use ordinances, easements, covenants, and rural zoning.)
8. Should State governments be encouraged to authorize lowering assessments and taxes to encourage recognized standards of proper land use?

The following points of view were brought out by various members of the Committee.

The current wind erosion area is not the same area where dust storms occurred in the 1930's.

It is a major undertaking to reestablish native grass. A year is needed to establish a cover crop. The next year the area can be seeded. Then there is a 2-year period of waiting before grass is fully established.

All Class 7 land should be seeded to grass. It will bring more return than other crops.

ACP payments should be spread over 4 years with an agreement by the farmer that he will not plow up grass for 10 years and will practice controlled grazing. It costs \$5 to \$6 per acre to seed land and the farmer loses the use of it for 4 years.

A lot could be done to stabilize the area if all available knowledge were put together and applied through a local mechanism that will help the people to help themselves. We don't know all we need to solve the problem, but we are not applying all we know. We should get our good tools to fuller use.

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USDA should designate one agency through which all work would flow. The view was expressed that the soil conservation district is the logical local vehicle through which to work. It was also pointed out that the best organization may not be the same in every county. Whatever interests there are in a county should be brought together and made to focus on the problem.

Public acquisition should be the last resort. There are very fundamental economic as well as social and land use problems involved.

The time to get grass established is in the period between droughts.

The demand for going ahead with the program in some areas is already ahead of the resources available to help. There is not enough technical assistance available to help the people who are ready to move ahead.

Farmers should be encouraged to go as far as they can without incentives and then bring incentives to bear to get even more accomplished.



There is an important national interest involved in this problem.

The view was expressed that soil survey work for land classification should be stepped up and that land capability information should be made a part of determining acreage allotments.

State governments should be encouraged to enact ordinances or establish regulations to prevent using land improperly once adjustments have been made in a setting where local people vote the restrictions on themselves.

State governments should be encouraged to authorize lowering assessments and taxes to encourage recognized standards of proper land use.

It was the consensus of the committee members that the recommendations of the Denver conference are good and that they should be implemented as rapidly as possible and they so recommended.

#### WATER MANAGEMENT PROBLEMS THROUGHOUT THE UNITED STATES

Background by Richard E. McArdle, Chief, Forest Service

We increasingly seem to have either too much or too little water. Yet, the country has enough water for all needs if had it at the right times and in the right places. Great variations occur across the Nation.

There are inadequacies in the natural distribution of water in place and time which are accentuated by great increase in demand for water. There are increased needs for populations, agriculture, industry, new uses for water (e.g., air conditioning), and recreation. There is growing competition for available water. The effect of land use on water yield and the influence on water yield result in growing conflicts in land use. Current shortages in municipal supplies, falling water tables, saline intrusions, pollution, and wasteful use of water are all serious problems.

There are three broad classes of water problems: (1) Those associated with water shortages, (2) those associated with water surpluses--floods, (3) those associated with water quality.

In solving these problems there are problems of education, of technical application of what we already know, and legal problems of water rights.

In proposing solutions to these problems we need to keep clear and distinct that some problems of water "use" pertain to water per se (e.g., kinds of use, priority of uses, ownership, storage, and transportation) and that USDA is more directly concerned with water control, water yield, and water use in relation to management of soil and vegetation. The topic under consideration chiefly concerns the treatment of soil and vegetation to avoid soil losses by water out of control, to make effective use of water where it falls for agricultural purposes and to save water for use elsewhere (quantity and quality). What we need to know is, are we doing the kinds of things needed





to do to accomplish these purposes? If not, what types of programs are needed? Or if kinds of current programs are o.k., are we falling short in some parts of these programs?

The following questions were placed before the Advisory Committee as a basis for discussion.

1. What can be done to meet the increasing demands for water?
2. Are farmers and ranchers applying land-treatment and installing water-conservation measures on the land at a rate commensurate with our water resources needs?
3. Is there much concern in western States about the losses and waste of irrigation water, how estimated to be 50% between source and field and 25% to 30% in field? Are there unnecessary losses of water and soil under irrigation as being practiced in the eastern States?
4. Will interest in irrigation in eastern States continue through a cycle of normal rainfall years?
5. How can private industry be further stimulated in the field of water conservation and mangement?
6. How should our water supplies be divided among industrial, domestic, and agricultural uses in the future? Who should make the allocations and on what basis?
7. How can problems associated with the inundation of valuable crop, pasture, or forest lands by major water impoundment works be overcome?
8. To what extent should USDA assist States on problems of water law?

Due to the lateness of the day there was only limited time for discussion on this subject. The following points of view, however, were expressed by various members of the Advisory Committee.

More water is used in irrigation than is necessary, even in areas where irrigation has been practiced for 100 years. Half of the irrigation water is lost in transporting to the users. The users lose half of the water delivered to them in the process of getting it to plants. Water lost in transporting, however, is used by other users downstream and if it were saved it would deprive downstream users of water to which they have rights.

Much progress is being made in learning to use irrigation water more efficiently due to the efforts of the Soil Conservation Service and the Extension Service. Greater efficiency can be obtained in water use by extending SCS technical assistance to farmers.



Excess flow of water that goes into the sea can be saved by putting it into storage, both surface storage and underground storage. Structures for surface storage are costly and such water is subject to losses through evaporation. There is much still to be learned about underground storage.

The high plains of Texas will be out of water within 50 years at the present rate of consumption and the supply cannot be renewed because there is no other source. Generally, however, the Nation has enough water to meet its needs if it is used efficiently. Efficient use will require much education and technical assistance. To control the water will require money. Much more can be accomplished with present knowledge than is now being done.

The public generally is very poorly informed on the facts of the Nation's water situation.

The possibility of using chemicals to stop evaporation of water from stored supplies such as ponds needs to be thoroughly explored.

It was the general consensus of Committee members that farmers and ranchers are not applying land-treatment measures and installing water conservation measures on the land at a rate commensurate with the Nation's water resources needs.

Friday, October 28

Mr. Milan D. Smith, Executive Assistant to Secretary Benson, extended personal greetings from Secretary Benson to members of the Advisory Committee. He said that Secretary Benson intended to be with the group but last minute developments required him to be away from Washington, including his scheduled meeting with President Eisenhower the following day in Denver. He told Committee members that the Secretary has full confidence in their advice and that it will be useful in improving the Department's activities in soil and water conservation.

#### OPERATIONS IN WATERSHED PROTECTION AND FLOOD PREVENTION

Background by D. A. Williams, Administrator, SCS

The Department of Agriculture has been concerned with watershed projects since passage of the Flood Control Act of 1936. Watershed improvement programs were authorized on 11 watersheds covering about 30 million acres by the Flood Control Act of 1944. Altogether the Department has expended about \$47,000,000 since 1947 in making improvements in these watersheds for flood prevention and land stabilization. The current year's appropriation for work on these watersheds is \$10,000,000.

In 1953 the Congress authorized a program of pilot watersheds primarily to demonstrate the advantages of watershed improvement on a more widespread scale throughout the country. We are now in the third year of operation on 58 pilot watersheds. The current year's appropriation for the pilot watersheds





is \$6,000,000. The cost of this program will be about 50 percent Federal and 50 percent local.

In August 1954 the Congress passed the Watershed Protection and Flood Prevention Act, Public Law 566. The widespread interest in this Act has been indicated in a number of ways.

Within a year the Governors of all States have designated agencies to be responsible in the State for review and approval of applications for assistance.

During 1955 20 States enacted 37 pieces of legislation designed to strengthen and improve the States' participation in carrying out watershed projects.

The Soil Conservation Service has so far received 410 applications for assistance from 41 States. An inventory made in September indicated that an additional 434 applications were in various stages of preparation, or were before State agencies for consideration. It seems likely that by the end of this fiscal year there will be at least 1,000 applications in some stage of development, approval, or action. The Soil Conservation Service has authorized planning assistance in 110 watersheds, or about one-fourth of the number requesting assistance, with State approval, to date. The Soil Conservation Service has organized 36 planning parties to date. We hope to complete 70 watershed plans by next July. When fully staffed and trained, our present planning organization should be able to prepare about 100 watershed work plans per year.

Appropriations for the current fiscal year provided \$5,000,000 for the Public Law 566 program.

The leaflet that has been distributed to you shows the principal steps required to develop and carry out a watershed project. We will be glad to try to answer any questions you may have about the procedures.

In the last session of Congress a subcommittee of the House Committee on Agriculture held hearings on two bills, H.R. 6146 and 6148, which would have the effect of adding authority for water conservation storage that is not now contained in the Act. Copies of these hearings are available for your use if you so desire. Bills have also been introduced to extend the application of the Act to Hawaii, Alaska and Puerto Rico.

Cost-sharing under Public Law 566 is not based on a fixed formula. The law itself sets up certain standards, as you know. Local organizations must provide land, easements, and rights-of-way; must acquire water rights; must contract for all improvements; and must operate and maintain the project. On the other hand, the law permits the Secretary of Agriculture to furnish all the needed technical assistance. The Secretary's policy provides that the landowners and operators in the watershed will be expected to install all of the needed land-treatment measures, the lack of which would adversely affect the structural improvements in the project.





The Federal Government will assume full responsibility for needed land treatment consistent with the purposes of the Act on lands under the administration of Federal agencies from appropriations under the Act.

Negotiation on cost sharing concerns primarily construction of structural measures. The policy of the Department is based on a principle expressed in the Act that local organizations shall "assume such proportionate share of the cost of installing any works of improvement involving Federal assistance as may be determined by the Secretary to be equitable in consideration of anticipated benefits from such improvements." This has meant to us that the local organizations should pay that part of the construction cost which is proportional to the benefits accruing to direct, immediately identifiable local beneficiaries, and the Federal Government should pay that part of the cost which is attributable to the public benefits. However, the Secretary's policy permits us to consider a proposal from the local organization that the Federal Government assume a share of the cost allocable to local benefits.

The following questions were placed before the Advisory Committee as a basis for discussion.

1. Are amendments needed to Public Law 566:
  - a. To simplify procedures, especially for small projects with relatively small Federal participation?
  - b. To expand scope of assistance authorized by including water conservation or water storage for purposes other than flood prevention?
2. What level of assistance should be contemplated under this activity in five years in light of the:
  - a. Number of applications being received?
  - b. Build-up in education and understanding of activity?
  - c. Availability of technical manpower?
  - d. Prospective status of Federal budget and availability of State and local revenues?
  - e. Relation to other Federal programs such as flood control (Corps of Engineers) and reclamation (Bureau of Reclamation)?
3. Is the present cost-sharing policy based on sound principles? Does it fairly meet the intent of the Act?



4. Is there a need for Federal credit or loan authority, beyond that now available, to implement the Watershed Protection and Flood Prevention Act?
5. Should there be any modification in ACP to further the watershed activity?
6. What steps should the Department take with reference to the Small Projects Bill, H. R. 5881, now in Conference Committee in the Congress, in view of the facts that:
  - a. It splits the country geographically for the same program between the Departments of the Interior and Agriculture?
  - b. It overlaps authority of the Water Facilities Act by setting no floor on the size of loans?
  - c. It extends the principle of interest-free loans which provide about 50% Federal subsidy?
  - d. It makes flood control a non-reimbursable grant from the Federal Government which is contrary to the cost-sharing principle in Public Law 566?

The following points of view were expressed by various members of the Advisory Committee.

In western states there is misunderstanding of the Watershed Protection and Flood Prevention Act in that some people believe that water would be held back on the upper parts of watersheds to the extent that it would reduce water flow downstream and deprive water users downstream of some water they have a right to. It was pointed out that the objective of watershed protection activities is to increase the yield of usable water from watershed areas.

It was pointed out that except for snow pack the holding of water on the watershed need not reduce waterflow downstream. To the contrary, the retention of water on the watershed area increases the continuous flow of water downstream. The planning of watershed development projects must take into account such local problems as they exist in differing degrees in various parts of the country.

Federal cost-sharing for the storage of irrigation water and increasing municipal water supply should be provided for in Public Law 566.

In some western states there is a real problem in getting water already available in streams through water development activities back to the farmers who are not adjacent to such streams. The Small Projects Bill should offer a solution to this problem. It was recognized that credit is available for



such work under the Water Facilities Act, but there is no provision for a Federal Government subsidy for this type of work. The 160-acre limitation in the Small Projects Bill is impractical to this type of situation. A need was expressed for some legal provision for assisting in water distribution systems which is not provided for in Public Law 566 or the Small Projects Bill.

The Chairman pointed out that the Department has taken the policy position that the full beneficial use of water should be provided for on work done under Public Law 566.

It was the consensus of the Advisory Committee members that Public Law 566 should be amended to provide for Federal participation in the construction cost of structures designed to store water for purposes other than flood prevention. They so recommended.

Several members expressed the view that a greater degree of recognition should be given to the local people's contribution in the cost-sharing arrangements of watershed protection projects. It was pointed out that the current cost-sharing policies are based on the principle that construction costs should be carried by the local people in direct relation to the local benefits.

It was recognized that local sponsors should bear their share of the costs and that local participation is necessary. It was also pointed out that in some instances the local people will not have the money to pay their share of the cost even if they will eventually get the benefits. Many people in the town do not appreciate the farmers' contribution in applying conservation measures on the land and in providing rights-of-way, etc. This is not as dramatic to view as a structure with a lake behind it.

If the work doesn't go ahead when the people are interested, they will lose interest and the work may never be done. Procedures should be revised to determine if the time required to get projects under way can be shortened.

The view was expressed that not enough credit is given to the public benefit of such works of improvement from the long-time view. The 85 percent of the people who live in the cities, now and in the generations to come, should be recognized more in the public benefits because they will be the major benefactors over the years.

It was recognized that if the cost-sharing arrangements were based on the local people's ability to pay, too often there would be no ability.

The Chairman pointed out that the net effect of watershed protection work will be to reduce the total amount of crop production. He also recognized that more than a million acres of good cropland are going into non-agricultural uses annually. The experience from pilot watersheds is that local people





are carrying 53 percent of the costs figuring land treatment, easement, rights-of-way and structural work. Department policy anticipates a similar magnitude for small watershed projects.

It was the consensus of the Advisory Committee members that the present cost-sharing policies should be continued on the small watershed projects and should be re-examined frequently in the light of experience.

It was pointed out that State and county ASC Committees have certain latitudes in using ACP funds to implement land treatment measures on small watershed projects. In some States, Iowa, Kansas, and Oklahoma for example, the ASC Committees have given considerable attention to the watershed activity. It was observed that this local attention had been a big stimulant to small watershed development. It was reported that in the Sandstone Creek Watershed in Oklahoma where the watershed treatment has been completed, ACP cost-sharing was especially helpful in getting land treatment measures applied.

It was observed that the lack of Federal appropriations for watershed protection and flood prevention was a very limiting factor in getting ahead with watershed development. Experience in the pilot watersheds indicate an annual expenditure of \$100,000 per watershed over a five-year period. One hundred completed work plans would indicate an appropriation increasing at the rate of \$10 million annually for applying works of improvement. The Rivers and Harbors annual appropriation is about \$300 million. There is no indication that the small watershed activity would reach that level.

Objection was voiced to the Small Projects Bill because it provides for one type of assistance in the West and another in the East. It is inconsistent to treat people differently in different parts of the country. Private landowners are more interested in Department of Agriculture programs than they are in reclamation projects. Flood control on the major basins is 100 percent Federal Government money. The Department of Agriculture has taken the position that the local contribution in cost-sharing on any project should be in direct ratio to the benefits derived by the local people. This is at variance with the concept of Federal participation in reclamation projects.

It was the consensus of the Advisory Committee members that every effort should be made to see that Public Law 566 and the Small Projects Bill are consistent in intent and purpose and are workable to get on with the job of better management of water resources in the upper watersheds.

#### RELATIONSHIPS OF SOIL AND WATER CONSERVATION RESEARCH TO OTHER CONSERVATION ACTIVITIES

Background by Sherman E. Johnson, Director  
Farm and Land Management Research, ARS

In his opening statement explaining the activities of the Agricultural Research Service, Dr. George Irving mentioned the administrative and cooperative relationships that have been developed between the Agricultural Research Service,



the Soil Conservation Service, and other conservation activities in the Department of Agriculture and the Land-Grant Colleges. He mentioned especially the close working relationships that have been established between ARS and SCS through cooperative employment of liaison workers at different field locations and here in Washington.

Nearly all of the research that is undertaken in the Department of Agriculture and the Land-Grant Colleges has some relationship to soil and water conservation activities. It is, therefore, necessary to consider several research fields in discussing the relationships to conservation activities.

In the Department of Agriculture, research is organized into Branches. The Soil and Water Conservation Research Branch is the group that is primarily concerned with research on the technical aspects of conservation problems. Most of the direct activities on conservation research are in that Branch. The Production Economics Research Branch is responsible for research on economic problems of conservation. Conservation activities are also closely related to Crops Research; for example, the establishment of grasses and legumes on some of the land which is better suited for permanent grass cover than for continued crop production. Our research in agricultural engineering is concerned with tillage machinery for conservation, fertilizer placement, and other engineering aspects of conservation. In most areas conservation farming means more pasture and harvested forage and this in turn requires feeding to roughage-consuming livestock; therefore much of the livestock research is related to conservation. These illustrations perhaps indicate the broad approach that needs to be taken in considering research on conservation problems.

With limited funds it is not possible to carry out research on all of the problems that arise. We, therefore, need to establish priorities concerning the unanswered questions to which research should be directed. In ARS we try to meet the high priority needs as they are expressed to us by SCS and other groups interested in conservation. We also try to make research results available as soon as possible. However, it is necessary to recognize that research takes time. Some answers can be obtained rather quickly, but for the most part research is like the planting of an orchard. It will not bear fruit the first year, but when it comes into bearing, fruit can be harvested over a period of years.

Conservation takes place on the land. Farm land is operated by some 5 million farmers. They make the decisions about conservation farming. In order to do that intelligently they need answers to two basic questions: (1) Will conservation practices work on my farm? and (2) Will they pay out? Because of the wide variations in soils, climatic and other physical and economic conditions, answers to these questions have to be provided by areas with broadly similar production opportunities if they are to be useful to farmers. To do that requires a more comprehensive program than it has been possible to undertake with available resources.





As I listened to your discussion yesterday I thought I detected a good many unanswered questions concerning both "Will it work?" and "Will it pay out?" They also covered both short and long-time spans. For the next several years one of our big farm problems is likely to be adjustment; that is, shifting from surplus crops, wheat and cotton, into products where the market is expanding more rapidly. Conservation and adjustment can be harmonious objectives. More trees, more grass, more hay and pasture, more roughage livestock as the market for livestock products expands would serve the objective of both adjustment and conservation. But question: Do we know how such shifts can be fitted into the most profitable systems of farming in different areas? In this connection I was much interested in your discussion of the Great Plains problems. You recognized the need for getting some of the poorer land back into grass, but you also reported that using the best known practices and with favorable weather it takes three or four years to get a stand of grass on most of this land. We could add that it costs about \$15 per acre to do the job. How is a farmer who has had three to five years of crop failure going to finance this shift? What returns will he get after the land is back in grass? How big a farm would he need in order to make a living? We also have many unanswered questions on the 85 percent or more of the cropland in the Great Plains which is suitable for continued farming. Moisture losses now average 60-70 percent of the total precipitation. This is only one of a host of unanswered questions on the better lands of the Great Plains.

Another set of questions faces farmers on the poorer cotton lands in the Southeast. And yesterday many questions were raised concerning irrigation in humid areas. Then we have the problem of providing a research background on hydrology and the economic problems pertaining to the watershed protection program. In this connection I want to mention that the SCS in its report to us on research needs listed as a top priority "A better understanding of the principles of water behavior on watersheds and in the various soils."

Looking much farther ahead as some of you did yesterday we need emphasis on basic soil, water, fertility and plant relationships in order to broaden the base of our understanding and as a foundation for applied research. Research of this type is time consuming. It usually does not provide quick answers to the day-to-day problems, but it must be kept going if we are to meet the needs of tomorrow.

The following questions were put before the members of the Advisory Committee as one basis for discussion.

1. In view of the increasing interest in watershed protection, does the public recognize the urgent need for additional hydrologic data on both forested and non-forested areas? Is there need for intensive effort to develop more efficient and more economical water control structures?





2. Should soil and water conservation research activities be re-examined with a view toward the modern, broad, conservation concept of protection and improvement for efficient, sustained production?
3. Do we have enough research facts on how much conservation pays the farmers?
4. Are we emphasizing sufficiently our research in soil, water, fertility, and plant relationships to meet the need for increasing efficiency in the management of crop and range lands?
5. Are there potentially significant returns and savings involved in:
  - a. A fuller knowledge of water requirements and consumptive use of water by individual crops in the various climatic zones?
  - b. Additional information on water in-take rates of various soils?
  - c. More reliable information as to proper timing of irrigation in relation to crop development stages and soil and moisture content?
  - d. Data on frequency and duration of drought in particular areas and on irrigation water requirements to overcome such droughts?
  - e. Are we clear in believing involvement in drainage technology offers great financial potentialities in the form of savings in initial costs and increased farm returns?

The following points of view were expressed by various members of the Advisory Committee.

There is urgent need for better public recognition for more research in soil and water conservation. Public leaders recognize the need, but the general public does not, which makes it difficult to get public support for funds to do such research. It is most difficult to get the general public to recognize the need for basic data.

Question was raised as to whether water research was important enough to constitute a water research branch. It was observed from experience in some States that while the separation of soil and water research had some advantages, it also had some serious bad effects. The opinion was expressed that the experience points to the fact that it would be a mistake to split water and soil research. It was recognized that State as well as Federal support of research in this field is inadequate.

It was observed that the Soil Conservation Service conservation needs report, developed all over the country, placed water research and its hydrologic aspects at the top of the list of all the problems and that ARS recognizes it in that way.



It was the consensus of the members of the Advisory Committee that soil and water conservation research is being and should continue to be reviewed in the modern broad conservation concept of protection and improvement.

It was pointed out that there is often a delayed return in the economic benefits from conservation, and that farmers had to make a living during that period. Reference was again made to the Farm Equipment Institute survey of farmers which showed that on the average farmers themselves believed that conservation farming increased their income by 30 percent.

It was also pointed out that the total economic values of conservation farming cannot be easily determined because of relationships with other aspects of the farm business. Good quality cattle, for example, will make a farmer more profit on improved pasture than poor quality cattle. It was the consensus of the members of the Committee that research on the economics of conservation should have high priority.

Point was also made of the fact that this is an era of high level advertising in all phases of our national economy on television, radio, etc. There needs to be more talking about the benefits derived from conservation farming. It was observed that there wasn't as much material available on these values at present as there was before the Soil Conservation Service information activity was reduced.

Regarding soil, water, fertility, and plant relationship, comment was made that there is an enormous need for facts in this field. We are just beginning to see the possibilities in this field.

Several members of the Committee expressed the view that short-term research projects on soil and water conservation should be located in the conservation action agency. Other members felt they lacked sufficient information to discuss this question. It was asked that the current procedures be documented for the Committee members. It was the consensus of the Advisory Committee members that the Department should review this item.

It was also the consensus of the members of the Committee that USDA should devote more funds to long-time soil and water research, and they so recommended.

UNDER SECRETARY OF AGRICULTURE, TRUE D. MORSE, was introduced to the Advisory Committee members. He said he would like to have sat in on much more of the meeting and get the direct benefits of the discussions, and that he is looking forward with great anticipation to the work of this Committee.

He said that soil and water conservation must be made an integral part of every agricultural program. He reported that the Rural Development Program is moving forward in 27 States despite the fact this activity has to be carried out without additional funds. Ten pilot counties are getting under way where work will move forward. He explained that this program will bring to bear specifically on the problems of low-income farmers and that soil and water conservation and forestry loom big in the program. The Rural Development program is designed to help any rural area to move forward more rapidly in the solution of its problems.





He said that conservation will also be a major item in the Department's long-range program for the Great Plains which is currently being developed.

He invited suggestions from Committee members on both of these programs, both at the meeting and following it.

## RELATIONSHIPS OF THE ACP WITH OTHER CONSERVATION ACTIVITIES

Background by Fred G. Ritchie, Acting Administrator, ACPS

The Agricultural Conservation Program National Bulletin is the broad basis from which local programs are developed. Sometimes it is necessary to adjust the program during the year to fit emergency conditions.

The 1956 National Agricultural Conservation Program has been developed and is to be carried out on the basis of the following general principles:

1. The national program contains broad authorities to help meet the varied conservation problems of the Nation. State and county committees and participating agencies shall design a program for each State and county. Such programs should include any additional limitations and restrictions necessary for the maximum conservation accomplishment in the area. The programs should be confined to the conservation practices on which Federal cost-sharing is most needed in order to achieve the maximum conservation benefit in the State or county.
2. The State and county programs should be designed to encourage those conservation practices which provide the most enduring conservation benefits practicable attainable in 1956 on the lands where they are to be applied.
3. Costs will be shared with a farmer or rancher only on satisfactorily performed conservation practices for which Federal cost-sharing was requested by the farmer or rancher before the conservation work was begun.
4. Costs should be shared only on practices which it is believed farmers or ranchers would not carry out to the needed extent without program assistance. Generally, practices that have become a part of regular farming operations in a particular county should not be eligible for cost-sharing. Individual farmers or ranchers should be encouraged to utilize cost-sharing for only those practices which have not become a part of regular farming operations on their farms or ranches.
5. The rates of cost-sharing in a county or State are to be the minimum required to result in substantially increased performance of needed practices within the limits prescribed in the national program.





6. The purpose of the program is to help achieve additional conservation on land now in agricultural production rather than to bring more land into agricultural production. Such of the available funds that cannot be wisely utilized for this purpose will be returned to the public treasury.
7. If the Federal Government shares the cost of the initial application of conservation practices which farmers and ranchers otherwise would not perform but which are essential to the national interest, the farmers and ranchers should assume responsibility for the upkeep and maintenance of those practices.

Principle number 7 is the most controversial one.

Substantial changes were made in the methods of operating the ACP program in 1953 and 1954. Those changes are now being better understood and more interest is developing in the program.

More of the program resources are being invested in enduring type practices. In 1954 there were large increases in the cost-sharing assistance given on establishing permanent type vegetation and stock water development. It is real encouraging to see this forward step. There is increasing interest to use ACP to help apply conservation measures on land diverted from allotment crop.

The program is authorized for 1955 and 1956 at a level of \$250 million each year. It is our purpose to get this money invested in good sound conservation measures.

The following questions were placed before the Committee as a basis for discussion.

1. What changes in the cost-sharing program or in its policies, operations or administration will give more effective results:
  - a. In total conservation accomplishment?
  - b. In achieving more beneficial effects from other USDA conservation activities?
2. Can conservation cost-sharing be used effectively in bringing about land use adjustments which are desirable from the standpoint of needed production adjustments?
3. What criteria can be used best in drawing the line between cost-sharing for conservation and paying a part of normal operating costs of farmers?
4. Should the public expect farmers to bear the full cost of the subsequent conservation treatment of a given piece of land if the program shares the initial treatment cost with the farmers?



The following points of view were expressed by various members of the Advisory Committee.

The general principles under which ACP is operating are good and the trend of the program is in the right direction. More sound conservation is currently being achieved through ACP than ever before. More is being achieved than is generally recognized. The emphasis being placed on enduring practices is good and should be increased.

The fact that the governing bodies of Soil Conservation Districts are invited to help in the development of the program in the counties and the Soil Conservation Service has the technical responsibility in the application of enduring practices has been a big help in getting more enduring conservation practices applied with ACP assistance. The trend for the future should be toward an even closer relationship.

It was observed that the limestone industry has depended on ACP to sell its product and that it needs to develop an effective sales force of its own comparable to that in the fertilizer industry. The fact that current ACP's policies and procedures are directed toward getting away from being the selling and merchandising agent for limestone was recognized and endorsed.

It was suggested that ACPS identify a few counties where the best progress is being made in using cost-sharing in the furtherance of applying enduring conservation and have those written up and made available to all counties as an example of what can be done.

Question was raised regarding the balance of resources going into conservation cost-sharing and technical assistance. Views were expressed that more resources were needed for both and that especially more technical services are needed than are now being provided for.

Question was also raised as to whether administrative procedures through the ASC Committees was the best system that could be found. The view was expressed that the administration of conservation cost sharing should be tied even closer to the administration of technical services.

There was considerable discussion about the need for clear-cut distinction between conservation cost-sharing and income supplement payments to farmers. It was the consensus of the members of the Committee that every effort should be made to keep agricultural stabilization programs separate and distinct from conservation programs so that conservation cost-sharing would not be looked on as an income supplement program.

It was asked that members of the Committee be furnished a summary of the practices for which ACP money is being spent and comparisons with previous years indicating the extent to which the program is shifting to enduring practices. It was also suggested that the ACP item be on the agenda for the next meeting of the Advisory Committee.



## SOIL AND WATER CONSERVATION CREDIT

Background by Stephen C. Hughes, Director,  
Loan Division, Farmers Home Administration

Reviewed the background statement made by Mr. Cogdell at the opening meeting of the Advisory Committee (see page 9).

The following questions were put before the Advisory Committee as a basis for discussion:

1. Is adequate credit available to farmers for carrying out soil and water conservation practices?
2. What changes, if any, need to be made in lending policies of creditors to better serve the need of farmers for carrying out soil and water conservation practices?
3. What factors influence farmers' decisions to use or not to use credit to finance soil and water conservation practices?
4. To what extent do cost-sharing programs, such as ACP, affect the use of credit to accelerate the adoption of soil and water conservation practices on farms?
5. Do farmers and creditors generally recognize that it is sound to use credit, if necessary, to accomplish needed soil and water conservation practices?
6. How can private credit render greater service in financing soil and water conservation practices?

It was reported that about \$20 million had been loaned under the Water Facilities Act since it was amended last year. About half of the amount was loaned for water development and about half for soil and water conservation.

A need was expressed for a type of credit for soil and water conservation whereby the Government would insure private loans made with private capital. It was pointed out that loans of this type are available for home improvement under the program of the Federal Housing Administration. So, a farmer can get a government guaranteed loan from private capital to fix his house, but he cannot get such a loan to apply soil and water conservation measures on his land. It was pointed out that the term of credit for such loans might need to be different than for a housing loan.

Discussion on this subject was limited due to the shortage of time. It was suggested that the subject of soil and conservation credit be placed on the agenda for the next meeting of the Advisory Committee and that before that meeting members of the Committee be furnished appropriate information about the soil and water conservation loan authorities and activities of the Farmers Home Administration.







## ADDITIONAL SOIL AND WATER CONSERVATION SUBJECTS

The question was put before the Committee, "What should be the relationship of USDA soil and water conservation activities to local organizations?" It was pointed out that USDA has relationships with various local organizations through the different agencies of the Department.

Time for discussion was very limited. It was pointed out that the bringing into play the various local organizations in the development of the annual ACP program, including the soil conservation district, is working very well. Since districts are established by State law in all States, it was the feeling of some members of the Committee that districts should be the logical local agency for channeling to farmers all USDA activities pertaining to soil and water conservation.

The question was put before the Committee, "What is the place of grass and tree nurseries in the total conservation effort?" It was pointed out that until 3 years ago SCS was operating some 24 grass and tree nurseries to make seed of scarce grasses and trees available to farmers until such time as the commercial seed trade could supply them. This activity was curtailed and limited to producing grass seed for observational purposes. The number of nurseries was reduced until there are presently 5 such nurseries operated by SCS and 7 nurseries being operated under contract for supplying SCS with seed of forage species for observational plantings.

Several members of the committee expressed the viewpoint that the Department had gone too far in withdrawing from grass and legume seed nurseries for conservation purposes. It was pointed out that commercial seedsmen would object to SCS being in commercial production of grass and legume seed, but that they wanted the conservation agency to field test new grasses and help in the build-up of seed supplies until commercial seedsmen can take over. The past nursery activity of SCS was reported to have accelerated the commercial grass and legume seed business and was liked by commercial seedsmen.

It was also pointed out that in the serious wind erosion area of the Great Plains the source of supply of seed stocks used during the past 10 years in converting cropland to grass started from the SCS nurseries. Without such a basic source of supply of improved grass seed, it will be impossible to move ahead with land use conversions in the long-range program for the Great Plains.

It was the consensus of the members of the Advisory Committee that the Department should make a re-evaluation of the grass and legume nursery activity with a view toward bringing this activity into better focus on the soil and water conservation problems throughout the United States.

Time did not permit the Committee to discuss the question, "What should be the relationship of USDA soil and water conservation activities with the activities of the Corps of Engineers and Bureau of Reclamation?"



## FUTURE FUNCTIONING OF THE ADVISORY COMMITTEE

It was suggested that the Advisory Committee be organized into subcommittees to function between meetings of the full Committee. There was discussion as to both the advantages and disadvantages of such organization. The Chairman indicated that there would undoubtedly be opportunities in the future to make use of subcommittees.

The Chairman indicated that it was the intent of the Department to have this Advisory Committee meet at least once each year. He did not know when the next meeting might be desirable because it will depend on developments. In the event that some actions should result from the next session of the Congress it might be desirable to have the Committee meet about the time Congress adjourns. He indicated that at the present time he would like to keep open the dates for the next meeting of the Committee.

He indicated that the notice of the meeting and the agenda for it would be put into the hands of the Committee members a month to six weeks in advance of the meeting.

It was suggested that consideration be given to having future committee meetings for a longer period of time such as three or four days, and that consideration be given to extending the meeting into a Saturday so that it did not require a full week away from private business.

It was also suggested that consideration be given to holding a no-host dinner one evening during the meeting to afford Committee members an opportunity to become better acquainted.

It was also suggested that the Department go ahead and work out the term of office for the various committee members on the geographic basis discussed on the first day. Subsequently names of Committee members have been determined for each of the three geographic areas as follows:

	<u>Eastern Section</u>	<u>Central Section</u>	<u>Western Section</u>
One-year term	Dr. Firman E. Bear A. D. Holmes, Jr.	Bill Durham Raymond A. McConnell	George D. Clyde T. R. Hedges
Two-year term	L. Roy Hawes Carl D. Shoemaker	R. Edward Baur L. W. Garver	Earl T. Bower William Rosecrans
Three-year term	Tom J. Hitch Mrs. K. J. Lee	Charles J. Elliott L. L. Males	Leo L. Anderson Wade Newbegin

The Chairman indicated he was highly pleased with this Committee. While much of this meeting was devoted to orientation, your discussions have been very helpful and valuable to us. He was especially impressed with the importance



the Committee members attached to water conservation and development. He expressed interest in their thinking about keeping the stabilization features of the Department's programs separated from the conservation features of the programs. He assured the Committee that the Department's thinking was in full accord with that principle.

The Chairman expressed the Department's appreciation to each individual member of the Committee for attending and taking part. He invited a free flow of communication between Committee members and the Department until the Committee is called to meet again.

Adjourned.





